

CLAIMS

We claim:

- 5 1. A spray chamber valve control system, comprising:
a plurality of valves positioned within a spray chamber;
a pump fluidly connected to said plurality of valves; and
a control unit in communication with said plurality of valves, wherein said
control unit ensures that at least one valve is open at all times during pump operation.
- 10 2. The spray chamber valve control system of Claim 1, wherein said valves are
each include a fluid sensor for detecting the presence of fluid near each of said valves.
3. The spray chamber valve control system of Claim 2, wherein said fluid
15 sensor within each of said valves is in communication with said control unit.
4. The spray chamber valve control system of Claim 3, wherein said control
unit monitors and stores the state of each of said valves.
- 20 5. The spray chamber valve control system of Claim 1, wherein said control
unit monitors and stores the state of each of said valves.
6. The spray chamber valve control system of Claim 1, wherein said control
unit selectively activates each of said valves to an open state or a closed state based
25 upon the presence of fluid at said valves.
7. The spray chamber valve control system of Claim 6, wherein said valves
have a magnetically latched design to maintain either an open state or a closed state
without continuous activation by said control unit.

8. A method of operating a plurality of valves in a spray chamber, said method comprising the steps of:

- determining fluid presence at one or more of said valves;
- 5 opening one or more of said valves that have fluid present;
- activating a pump fluidly connected to said valves; and
- determining if a state change is required of any of said valves and executing said state changes if at least two valves are open.

10 9. The method of operating a plurality of valves in a spray chamber of Claim 8, including the step of executing a one valve open recovery routine when if a state change is required to open a second valve and only a first valve is currently open.

15 10. The method of operating a plurality of valves in a spray chamber of Claim 9, wherein said one valve open recovery routine is comprised of the following steps:

- deactivating a pump;
- opening said second valve after a delay time; and
- reactivating said pump.

20 11. The method of operating a plurality of valves in a spray chamber of Claim 8, including the step of performing a routine valve scheduler routine upon said valves for maintaining said valves in their respective desired state.

25 12. The method of operating a plurality of valves in a spray chamber of Claim 11, wherein said routine valve scheduler routine is comprised of the steps of:

- (a) energizing a first valve to an appropriate state; and
- (b) repeating step (a) for a next valve.

13. The method of operating a plurality of valves in a spray chamber of Claim 11, wherein said routine valve scheduler routine is comprised of the steps of:

- (a) energizing a first valve to an appropriate state; and
- (b) repeating step (a) for a next valve after a time period.

5

14. A method of performing a one valve open recovery routine within a thermal management system wherein only a first valve is open and a second valve is to be opened, said thermal management system having a spray chamber, a plurality of valves within said spray chamber, and a pump fluidly connected to said plurality of valves, said method comprising the steps of:

10

- deactivating said pump;
- opening said second valve after a delay time; and
- reactivating said pump.

15

15. The method of performing a one valve open recovery routine within a thermal management system of Claim 14, wherein said delay time is at least .25 seconds.

20

16. The method of performing a one valve open recovery routine within a thermal management system of Claim 14, wherein said delay time is between .25 seconds and .75 seconds.